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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,725	10/17/2003	Yicheng Long	47911-A	8286

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EXAMINER	
WEBB, CHRISTOPHER G	
ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/686,725

**Applicant(s)**

LONG ET AL.

**Examiner**

Christopher G. Webb

**Art Unit**

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-13, 15 and 17 is/are rejected.
- 7) ☒ Claim(s) 10, 14, 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20040203, 20040223.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner et al. (US 6,507,401 B1, hereafter Turner) in view of Alvarez et al. (US 5,712,165, hereafter Alvarez).

With respect to claim 1, Turner teaches a method for providing rapid on-line analyses of chemical compositions using NIR spectroscopy with chemometrics comprising: analyzing a series of samples using standard laboratory analytical procedures (col. 4, lines 43-55), utilizing the results as reference values to establish calibration models from NIR spectroscopy using chemometric techniques (col. 4, lines 56-58), providing an NIR spectroscopic system comprising a probe (fig. 1, element 10) coupled via fiber optic cables (fig. 1, element 13) to a stable white light source (col. 11, lines 12-13) and a spectrograph (fig. 1, element 18), inserting said probe into a chemical composition (fig. 1, element 3) to be analyzed and beaming to said probe a stable white light of selected wavelength range (col. 11, lines 12-19) and recording the spectra obtained on the spectrograph (col. 12, lines 16-18), and correlating the spectra obtained to the reference data stored in the computer to obtain a rapid measurement of the analysis desired (col. 17, lines 31-37). Turner does not teach that the probe is a

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transmittance or transreflectance probe, nor does Turner teach specifically that the data is stored in a database. However, transmittance is clearly measured as seen in fig. 2A.

Alvarez teaches a method and apparatus for use with hydrocarbons that includes either a transmittance or transreflectance probe (col. 18, lines 15-17). It would have been obvious at the time of invention to one of ordinary skill in the art to use the probe described by Alvarez in place of the probe of Turner. The probe types provide variation in the way that the probe must be oriented to collect data, i.e. the transmittance probe is useful in a situation where there is a path from the source light to the detection area and the transreflectance probe is useful in situations where the source light and detection area are oriented in the same direction. Furthermore, it would have been obvious at the time of invention to one of ordinary skill in the art to store the calibration data in a database because otherwise the apparatus would have no way of accessing the initial data for determination of the analysis desired.

As to claim 2, Turner discloses that the chemometric techniques are based on eigenvalue decomposition of a data matrix (col. 22, lines 62-64).

As to claim 3, Turner discloses that the eigenvalue decomposition determinations utilized PCA (col. 22, lines 21-22) and PLS (col. 23, line 11).

As to claim 4, Turner discloses that the composition may be a chemical process stream (col. 1, lines 56-63).

As to claim 5, Turner discloses that the chemical composition may be a test sample (col. 17, lines 59-60).

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As to claim 6, Turner discloses that the analysis being conducted is the determination of a concentration of a component in the composition (col. 4, lines 13-15).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Alvarez as applied to claim 1 above, and further in view of Tubel et al. (US 6,281,489 B1, hereafter Tubel).

As to claim 7, Turner in view of Alvarez does not teach that the analysis being conducted is the density of the chemical composition. Tubel teaches the use of spectroscopic equipment to determine the density of a chemical composition (col. 3, lines 27-34). It would have been obvious at the time of invention to one of ordinary skill in the art to use density as one type of analysis conducted by the apparatus of claim 1. Knowing the density of a product stream can give the operator an idea of the composition of the stream as well as other information not readily apparent by other means of inspection.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Alvarez as applied to claim 2 above, and further in view of Wilt et al. (US 6,087,662, hereafter Wilt).

With respect to claim 8, Turner in view of Alvarez does not disclose that the process stream is a solvent diluted froth obtained in the extraction of bitumen from oil sands. Wilt teaches the use of a spectroscopic system for analyzing a solvent diluted froth produced when extracting bitumen from oil sands (col. 1, lines 17-19). It would

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have been obvious at the time of invention to one of ordinary skill in the art to use the apparatus described by claim 2 on a process stream of solvent diluted froth. This would be obvious because diluting oil sands with a solvent is the commonly used method for extracting bitumen from the oil sands.

As to claim 9, Turner in view of Alvarez does not teach that the asphaltenes content of the process stream is determined. Wilt teaches a method for determining the asphaltenes content of a process stream (col. 1, lines 49-52). It would have been obvious at the time of invention to one of ordinary skill in the art to determine the asphaltenes content of the process stream taught by Turner in view of Alvarez. As noted by Wilt (col. 1, lines 33-35), "sulfur found in crude oil asphaltene residual is unwanted in highly valued products such as gasoline and diesel fuel."

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Alvarez and Wilt as applied to claim 8 above, and further in view of Tubel.

As to claim 11, Turner in view of Alvarez and Wilt does not teach that the density of the process stream is determined. Tubel teaches the use of spectroscopic equipment to determine the density of a chemical composition (col. 3, lines 27-34). It would have been obvious at the time of invention to one of ordinary skill in the art to use density as one type of analysis conducted by the apparatus of claim 8 for the reasons noted above with respect to claim 7.

Claims 12, 13, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Alvarez and Wilt as applied to claims 8, 9, and 1 above, and further in view of Mullins et al. (US 2002/0139929 A1, hereafter Mullins).

As to claims 12 and 13, Turner does not disclose the use of NIR wavelengths in the ranges 900nm-1700nm and 1000nm-1100nm. Mullins teaches that the source wavelength is in the ranges 900nm-1700nm and 1000nm-1100nm (fig. 4). It would have been obvious at the time of invention to one of ordinary skill in the art to use the wavelength ranges of Mullins as the output ranges for the source taught by Mullins in the apparatus of Turner in view of Alvarez and Wilt. As noted by Mullins (paragraph [0035] and paragraph [0036]), wavelengths in this range are useful in determining properties such as particle size of asphaltenes.

As to claim 17, Turner in view of Alvarez does not specifically disclose that the system is highly stable and free of moving parts. Mullins teaches a system that is understood to be highly stable and free of any moving parts (paragraph [0018], line 3). It would have been obvious at the time of invention to one of ordinary skill in the art to incorporate the stability and freedom from moving parts of Wilt in the system of Turner in view of Alvarez. A system that is highly stable and free of moving parts would be useful in an industrial setting where it could be fixed into place and not need frequent servicing or adjustment.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Turner in view of Alvarez, Wilt, and Tubel as applied to claim 11 above, and further in view of Mullins.

As to claim 15, Turner discloses that the source wavelength is in the range 1000nm-1600nm (fig. 4). It would have been obvious at the time of invention to one of ordinary skill in the art to use the wavelength ranges of Mullins as the output ranges for the source taught by Mullins in the apparatus of Turner in view of Alvarez, Wilt, and Tubel for the reasons described above with respect to claims 12 and 13.

### ***Allowable Subject Matter***

Claims 10, 14, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The determination of the solvent-to-bitumen ratio of the process stream using NIR spectroscopy was not found in the prior art. Also, the use of a light pass length in the range of .1mm-20mm was not found.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,866,983 discloses relevant prior art.




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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher G. Webb whose telephone number is (571) 272-8449. The examiner can normally be reached on 9AM - 5:30PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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